

nursery and maternity floors, and to the surgery. Surely in wartime anything that helps to cut out the frills and special luxuries, that have gradually crept into hospital care, should have the whole-hearted support of the physician. If the shortage of beds and nurses becomes very acute, it will be necessary to shorten the stay of each patient. Beds should not be occupied by rest-cure patients, by permanent boarders, by patients with a slight cold, or similar types. The obstetric patients can be sent home early. The uncomplicated surgical patient can be sent home by ambulance.

A suggestion is made that the Association of Hospitals in any given locality could make a survey to determine how many small hospitals, sanitariums and rest-homes might be accredited and made available to receive convalescent patients. This would operate to make available more hospital beds and effect quite a saving to the patient.

The busy physician who is already overburdened may object as more calls will have to be made at home; but if the beds are needed for other sick patients, there may be no other way out.

Let the doctor attend to the practice of medicine, and have the hospital confine itself to hospital service.

Any tendency upon the part of the hospital to render or countenance any service which, by law or medical ethics, is generally construed as the practice of medicine, should be discouraged. For example: The practice of anesthesia is a branch of medicine. In the organization of the American Medical Association, anesthesia has a section, as have surgery and obstetrics. Regardless of the specious pleas of those who are in favor of, and who employ lay anesthetists, the practice of this branch of medicine should be limited to Doctors of Medicine.

IN CONCLUSION

We must not forget that we have a job to do. We are committed to the principle of the private practice of medicine, to the *patient-doctor relationship*, and if we are to maintain the American way of life and of medical practice, we must do our share in coöperation with the hospital to give good care to the patient and, at the same time, keep down the rapidly-rising cost of sickness.

1930 Wilshire Boulevard.

If one continues to ply one's mind, growth ensues, even in the years formerly supposed to be marked by stagnation and decay. To foster this growth one must not trust too much to the casual gains of every day work and experience. One must put forth well directed efforts. Merely to maintain one's status is not enough. He who is satisfied to stand still will soon slip backward. To grow one must go on learning. So it has come about that education, formerly thought to be an activity limited to the days of one's youth, is now seen in one form or another to be desirable in all periods of life. Thus one continues to improve; thus one keeps young.—Leon J. Richardson.

WAR SURGERY*

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THIS subject of war surgery which has been assigned to me covers a field so large that I must of necessity limit myself to those subjects in which I am, as an orthopedist, particularly interested. During a recent trip to England, I was fortunate enough to have charge of the American Hospital in Britain for over six months. This fact rather, than any special knowledge of my subject that I may have, undoubtedly influenced your program committee to extend to me their flattering invitation to be here with you. With the literature so full of articles dealing with first-hand experiences, and many in this audience qualified to speak authoritatively on all branches of war surgery, I feel somewhat apologetic in appearing before you. But I will, nevertheless, endeavor to emphasize some of the factors that seem particularly important.

War surgery, in the sense that is generally understood, is fundamentally nothing more or less than the surgery of trauma, carried out under circumstances and conditions, and frequently far from ideal and, may be, ghastly and almost impossible to cope with. However, the underlying principles of surgery as practiced in times of peace, still hold good, and if the best possible work is to be done, these fundamentals must be thoroughly ingrained in individuals called upon to serve. No rule of "thumb" can be applied to every particular case, and surgical judgment is vital, not only in the active treatment of that case, but also in the picking of the time and place of that treatment, where this is possible. Many factors must be considered, and some of these will be discussed as we go along.

PROCEDURES IN WORLD WAR I

With a comparatively fixed front line as was seen in World War I, where the danger zone was narrow and attacks by airplanes were rare, the wounded could usually be evacuated back through the sorting of casualty clearing stations, evacuation hospitals, mobile hospitals and other units where the necessary treatment could be carried out. And the severely injured might be kept as long as necessary to make removal to a base hospital safe. Fractured femurs were sewn up in bulken frames only a few miles behind the front lines, and wards were filled with patients who could not be evacuated for weeks following their injuries. Working in hospitals, the surgeons, although severely pushed, could carry out almost ideally their necessary work with the excellent results that we all know. With modern warfare, however, the picture is different, of course. The fighting may be many miles in depth and there is practically no limit to the areas which can be

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bombed. Under these circumstances, the care of the wounded at the so-called front must frequently be modified, and the surgeon must decide whether immediate evacuation, if possible, even with the delay in adequate treatment is not better, than the surgery that can be done before evacuation. I have seen, in not a few cases, where incomplete and hurried surgery probably did much more harm than would have the few extra hours' delay during which the patient could have been transported to a safer and better-equipped hospital or environment, and where the most accepted treatment could be carried out properly.

SURGERY IN BOMBED CITIES

The use of the sulfa drugs enters the picture here, but will be discussed a little later. This point of fresh surgery if done, should also be considered when working in bombed areas in cities. Here there are always hospitals within a few miles, and the first aid and casualty station treatment should be limited to life-saving treatment. The use of morphine in large doses for pain, temporary splinting of fractures and the major surgical work left for the hospital staff. There is little or no use for motorized mobile surgical units in and around cities with adequate hospitals, as has been amply demonstrated in Great Britain. But these hospitals in areas subject to severe and frequent bombing must be kept ready for new casualties. And, this means that evacuation of all possible cases to institutions in the country or outside the area must be rapid. In some places in England, 60 per cent of the beds are supposed to be available each night, and with civil surgery still necessary the various problems which arise as a result of this can readily be seen. Elective surgery under these circumstances should be sent to the outside areas, and cases operated upon there rather than run the risk of possibly too early postoperative evacuation. I saw one convoy of patients come into the British side of the hospital where we were working which consisted of postoperative hernias, knee cartilages, and similar cases, all of whom had been operated upon within a week and some one day before. The staff of the hospital from which these men came had been overanxious to keep busy, and their patients had suffered accordingly when evacuation was ordered.

The compound fractures that we saw which came from London and the South Coast were treated, on the whole, very satisfactorily. Debridement, so well done, sulfanilamide placed in the wounds, and the closed plaster technique used were feasible. The results were definitely better, I believe, than in similar cases during the last war, and gas infection was at a minimum. The closed plaster method of Orr and Trueta has certainly demonstrated its usefulness in compound fractures. Like all methods in surgery it is not automatic, a certain amount of knowledge on the part of the surgeon must be behind its use, if good results are to be obtained. Unfortunately, this has not always been the case and the violent

criticism which the French surgeons and others have made of Trueta's work cannot be directed logically at the work itself, but only at the surgeon performing that work. Even then a certain amount of charity must temper one's judgment when the conditions under which many of these men were working are brought into the picture. The method has been used by so many of us for so many years in civilian practice that we were not surprised at the results published by Trueta, or for that matter at the bad results observed in the wounded who escaped to France from Spain. After all, it is highly probable the majority of these latter were better off than with any other treatment that could have been given under the circumstances, and they were mobile as a result of the plaster of paris fixation and were able to escape which would have been impossible with a treatment like suspended traction.

The method is applicable in fresh and older cases alike and consists, as you know, primarily of a complete debridement of the wound. Apparently, the lack of this complete debridement is a point upon which most of the failures can be blamed as far as infection is concerned. However, there is ample evidence to show that even an infected wound will do better and the infection be limited locally with complete fixation; under the stress of many casualties, it might be better to place cases in plaster with no cleansing of the wound, but with pain and shock controlled and evacuation possible, rather than do incomplete debridements. One must also decide in this connection whether complete and proper treatment should be carried out at the necessary expense of others, and if so, what is the best treatment for the remaining group. We cannot be too critical of any man's work until we know the circumstances surrounding that work. Barnes, at Oxford, and many others have shown that complete immobilization of a part in plaster of paris causes complete stasis of the lymph flow and as infection travels, mainly by the lymph ducts, and infection in a wound will be confined to that local area with complete fixation which, of course, experimentally bears out all that the plaster fixation of Orr and Trueta have shown clinically.

Ideally, the debridement of a compound fracture or of a bad wound must be complete, with the removal of all dirt tissue such as clothes, metal, and stone, etc. Following this Trueta packs the part with dry gauze and this is the part in plaster paris, the fracture at present being adjusted as accurately as possible. The casing is left in place as long as possible, so as to allow healing to progress, in spite of the fearful stench that still develops, although there is remarkably little discharge in the cases seen early and thoroughly debrided. Padding can be placed over bony prominences, to minimize the danger of pressure sores, if desired, but otherwise the plaster is unpadded. With newer plaster technique, sad complications, due to pressure or influence

with circulation, develop, but they are preventable with a little care on the part of the surgeon. There are other obvious drawbacks to this method, most of which can be easily overcome by changes in the technique without any change in the underlying principles. Vaseline gauze is advocated by Orr and it always seemed to me to be better than the dry gauze packing of Trueta. And, after I have struggled a few times to dissect out a dry pack which has become an integral part of the patient, I was sure of my conclusions. If anyone has ever tried to take out a large piece of dry gauze that had been placed in the wound and left in place for several weeks, the granulations forming through it and then organizing, he will realize what I mean.

A further modification of the original method, Jensen has definitely shown in his series of cases that the implantation of sulfanilamide into the wounds of compound fractures, after debridement has decreased the incidents of infection to only slightly over three per cent. The experience of the English and more recently our own forces has borne this out.

A packing which some of us have used with success is made of gauze impregnated with cod liver oil ointment in which sulfanilamide and sulfathiazole have been mixed. This appears to be very efficient in old infected wounds also.

SULFA DRUGS AS AIDS

Where adequate local treatment must be delayed in wartime, due to many conceivable factors, there can be no doubt that the sulfa drugs used by mouth and local implantation can alone prevent many infections and save many lives. The local irritation to the tissues in the wound which we know to be present is apparently more than compensated for by the bacteriostatic action of the drugs, but certainly large amounts are not needed as the solubility even of sulfanilamide is very low. Sulfathiazole is so insoluble that I have seen so many wounds with plaques and masses of what appeared to be plaster of paris particles in them even weeks after introduction of the powder, and it is evident that this condition must interfere with healing.

Large quantities of the sulfa drugs should not then be implanted locally, as no good can come from their excessive use and definite harm might result, not to mention conservation of the drugs. Large doses have been used locally, of course, with no apparent bad result, and we had one compound patella which came to us after a primary excision of the bone and a primary debridement of the knee joint, with a note that 22 grams of sulfanilamide had been placed in the wound before doing the primary closure. The wound was healed perfectly, and the plaster was removed three weeks later; but one wonders if quicker and freer motion in the knee might not have been obtained if the irritative action of the excessive amount of sulfanilamide had not been added to the trauma itself.

We performed one interesting experiment on a group of cases with sulfathiazole. In the British army, and of course in civilian life, there are many knee-joint injuries due to the fact that one plays football of the nature of what we call soccer. So, therefore, semi-lunar cartilage lesions are very common, and the convays would come in with fifteen which was the largest in any one day, all of which had to have cartilages removed. We thought it might be well to see what sulfathiazole would do in a joint, as far as the level was concerned. So we started in on these cases and gave them 2 grams of sulfathiazole at noon the day before, 3 o'clock in the afternoon, and then at six, and after that at four-hour intervals, giving a gram and a half until six the next morning. They go to the operating room the next morning. The urine would be taken. The blood would be taken in the operating room. We would open down to the synovial membrane of the knee and then with a needle aspirate the knee joint fluid. After running thirty of these and the findings all being the same, we stopped because we found that the level of milligrams per cent in the synovial fluid of these knees was, to all intents and purposes the same as the blood level. So that the synovial fluid in a joint of this character certainly contained the drug practically the same as did the blood itself. We also found this appeared in what was called closed cavities.

There was a young soldier who had a bursa under one of the hamstrings about the size of an egg, according to his history, and which had never bothered him at his work, but which when he got into the army began to irritate him. We excised it without breaking it, giving him the sulfathiazole from the day before in the same way as we did in the knee cases. And we found that the sulfathiazole level in the fluid in this bursa was almost up to the blood itself, showing how the drug does go through the body, and how there is an interchange at all times. I believe that this seems to have some definite bearing on the treatment of joint injuries with potential infection.

COMMENT

Changes of plaster being treated by the Orr-Trueta method, and this does become absolutely necessary at times, may cause disturbance of the fractured fragments, and for this reason and as well as for the facts that certain fractures as in the shaft of the femur, for instance, cannot be held properly with plaster alone, so further fixation is needed if it can be obtained. At the American Hospital, in Britain, pin fixation, as described by Orr and Anderson, and Haynes and others was utilized for this purpose, and we believe it has a definite place in war surgery both in compound and simple fractures. I have a movie of some of these cases which I am going to show before the Section on Surgery tomorrow. With this type of fixation, that is, a pin fixation, patients are more mobile, and plasters can be changed as often as necessary, without any danger

of motion at the fracture site. In one of our badly-comminuted, compounded-infected femurs the Anderson pins was left in for six and a half months until the healing of a large soft part wound and the fracture itself had taken place. The pin holes healed up within a few days.

I was asked to come down to a meeting of the Medical Officers of the First Canadian Division who had an organization, and to give a talk on this matter. They sent up three ambulances and I took a dozen men down from our hospital, one of whom had a fractured femur that had only had the pins put in the day before. It was 45 miles away and 45 miles in Southern England, even in peace times is equivalent to twice that over here because of the winding narrow roads, etc. We took those men down there, gave a clinic on them, came back, and demonstrated very definitely how these war casualties could be evacuated and carried without producing any shock, with and only, of course, the tiredness that goes with the trip. And, in areas (and that means all of Great Britain which is subject to bombing at any time), these cases of fracture must be gotten out of the congested areas or the areas where bombing might take place and out into the hospitals in the country. And, fractured femurs can be moved without a great deal of trouble, with pin fixation.

Time does not allow me to take up any of the other subjects which are of such prime importance in war surgery, or to describe my observations on them in England, and I see that most of them are covered in your program later. Blood banks, plasma, treatment of burns, early skin grafting, peripheral nerve injuries, and other measures might all be discussed at length, and are as vital as any of the factors that I have mentioned. In closing, it should be emphasized that with basic surgical training it is not always a question in wartime of what a surgeon should do, but of how and when to do it. Only broad surgical judgment and experience can decide these factors.

25 West Fourth Street.

CENTRAL NERVOUS SYSTEM SYPHILIS

ITS TREATMENT AT THE STOCKTON STATE HOSPITAL

F. S. MARNELL, M. D.
Stockton

BECAUSE of the shifting of population, due to war work and men in our armed forces, there will be an increase in syphilis, and a certain number of these cases will develop central nervous system syphilis.

We believe that a report of cases treated in the Stockton State Hospital will be of interest to medical men, and will encourage them to make an early diagnosis and see that these cases are properly treated before they become hopeless. For this reason, the Department of Institutions has set

aside wards where those so afflicted may come and be treated. If they are unable to come voluntarily, they can be sent by the courts to have the treatment with which they can, in some cases, be restored to health. There has been a gradual increase in the numbers of cures as new methods have been established, and as these methods are improved we hope to increase the number of those who can be returned to civil activities.

CLINICAL MATERIAL

This report includes 314 cases of central nervous system syphilis which were treated with malarial fever. Eleven patients died during the treatment or shortly after the fever was terminated; 169 were paroled or discharged as well enough to resume normal activity, and five of these were returned as unable to get along. The youngest was 13 years old and the oldest was 62. Many of the patients were disturbed, some had bed sores and seemed hopelessly in advanced stages of the disease. One hundred and eleven came voluntarily.

PROCEDURES

All of the patients showing syphilis are fluoroscoped to determine the condition of the heart and aorta. In some who showed marked syphilitic heart disease, an improvement was noted by the use of potassium iodide and bed rest.

First, three weekly doses of tryparsamide were given to find the patients' reaction to the drug, and to allow them to become used to the new surroundings. They were then given intravenous blood drawn from a patient about to have a chill, and with a large number of parasites; about two c.c. of blood was drawn into a syringe with citrate solution and injected into the patient. This was followed with 10 c.c. of glucose solution through the same needle. If no chills resulted in four weeks, the dose was repeated. The patient was allowed to have about 12 chills, more or less, depending on the physical condition of the patient. They were given Vitamin C, as well as a generous amount of well-sweetened lemonade and occasional intravenous doses of Vitamin B in glucose solution. All were given extra diet high in sugar. The intravenous glucose helps prevent convulsions as well as keeps up the strength, and we have been able to keep patients alive when they seemed unable to stand the treatment. Too frequent chills were controlled by five grains of quinine. The malaria was terminated by atabrine and quinine, as we found there might be a return of the malaria unless both were given. Three weekly doses of neo-arsphenamine were given, and then 20 doses weekly of tryparsamide, followed by four weekly doses of oily bismuth. This routine was followed until 100 doses of tryparsamide were given, and then a spinal test was taken to determine the results. The bismuth is given so that the patient does not establish a tolerance to the arsenical, as we have found bismuth to be of little help in these cases.